Nuclear Data for Waste Transmutation in the EURATOM Fifth and Sixth Framework Programmes

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The Fifth Framework Programme (FP5) (1998-2002) of the European Atomic Energy Community (EURATOM) has come to an end and the Sixth Framework Programme (FP6) (2002-2006) has now started. The Euratom FP6 Research and Training Programme on Nuclear Energy includes three thematic priorities, fusion energy research, management of radioactive waste and radiation protection. It also includes other activities in the field of nuclear technologies and safety. The research on nuclear cross section data for transmutation lies within the topic of Partitioning and Transmutation (P&T) which falls under the thematic priority area of management of radioactive waste. The budget for P&T during the FP6 is about 20% of the overall budget of 190 MEuro for Nuclear Fission and Radiation protection.

For the design of an Accelerator Driven Sub-critical System (ADS), nuclear cross section data are required at high energy for the spallation target and structural materials, and over a wide energy range for the isotopes considered for transmutation. In FP5, the EU has funded two projects on nuclear data. The first project (HINDAS, budget 2.1 MEuro) has been completed at the end of November 2003 and its main objectives were to collect most of the nuclear data necessary for ADS applications such as for the engineering design of ADS, spallation target and structural materials. This has been achieved by basic cross section measurements at different European facilities, nuclear model simulations and data evaluations in the 20-200 MeV energy region and beyond for iron, lead and uranium. The second project (n-TOF-ND-ADS, budget 2.4 MEuro) will be completed at the end of 2004 and it aims at the production, evaluation and dissemination of neutron cross sections for most of the radioisotopes (actinides and long-lived fission products) considered for transmutation in the energy range from 1 eV up to 250 MeV. Measurements are carried out at the n_TOF facility at CERN, Switzerland, at the GELINA facility in Geel, Belgium and using other neutron sources located at different EU laboratories. Further well-focussed nuclear data activities are foreseen in FP6 within the framework of a single large integrated project on transmutation using ADS which is likely to start at the end of 2004.

In 1992, the European Union, Japan, the USA, Norway and the Republic of Korea as the funding parties have established an International Science and Technology Centre (ISTC) at Moscow. The ISTC finances and monitors science and technology projects to ensure that the Commonwealth of Independent States (CIS) scientists, especially those with expertise in developing weapons of mass destruction, are offered the opportunity to use their skills in the civilian fields. An improved co-operation between ISTC and FP5 EU funded projects on nuclear data for ADS has been established and will be continued in FP6.

The paper will discuss the EURATOM FP5 and FP6 nuclear data projects and the international collaboration in this field including that with ISTC.

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